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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Inventor(s): Julie Baker, et al.

FOAMED POLYMER LAYERS
AS INKJET RECEIVERS

Serial No.: 10/631,236

Filed: July 31, 2003

Group Art Unit: 1774

Examiner: Schwartz, Pamela R.

Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER RULE 132

The undersigned, Julie Baker of Watford, United Kingdom, declares that:

Her education includes a first class honours degree in Chemistry from Thames Valley University, England.

She joined Kodak Ltd in 1986 as a Research Scientist working on a range of development projects, including ten years working on the design of novel inkjet media for improved ink absorption, image quality and stability. She has also undertaken studies to develop world class inkjet media with substantial reductions in manufacturing costs. She has patents that have issued on 19 different inventions.

She is co-inventor of the above-captioned application, along with Joanne Hunt, a former co-worker at Kodak Ltd.

She has reviewed the outstanding Office Action on the above-captioned application in which the Examiner has rejected under 35 U.S.C 103(a) claims 5-7, 9-12 and 16-22 as being unpatentable over Iwasa *et al*, US 2002/0012786.

She has completed a previous Declaration under Rule 132, signed 25 September 2008 and filed with a Request for Reconsideration (RCE) mailed November 3, 2008, which previous Declaration is referenced by the Examiner in the Office communication mailed December 16, 2008.

In the previous Declaration, she stated that if there were a significant quantity of a 'non-hydrophilic', i.e. hydrophobic, polymer within the media formulation of the invention, there would be substantially less capacity for the absorption of the fluid, as the fluid would only be able to access the smaller percentage of pores that are surrounded by the hydrophilic polymer. This is because the hydrophobic polymer would not allow the fluid (a significant part of which is water) to pass through it and access the pores. Any excess fluid not reaching the pores would therefore have to be absorbed by the reduced level of hydrophilic polymer present, which would in turn result in a much slower rate of absorption of the ink off of the surface, thus materially affecting the characteristics of the invention.

The data in Table 1 below for additional experiments conducted similarly as described in the Example of the above-captioned application shows the density of ink transferred during the drytime test as described at page 5, lines 18-20 of the specification when varying amounts of the PVA (a polymer containing only hydrophilic groups) is replaced with hydroxypropyl cellulose (HPC) (a polymer containing both hydrophobic and hydrophilic groups, and which is therefore more hydrophobic than PVA):

PVA (g/m^2)	HPC (g/m^2)	% HPC	Density of Ink Transferred
20.4	0.0	0%	0.55
10.0	10.0	50%	1.14
5.0	14.9	75%	2.06
0.0	19.7	100%	4.89

Table 1: The effect of PVA & HPC laydown on the density of ink transferred

NB. For all samples, the level of blowing agent used with respect to the total polymer level (PVA + HPC) was 50%.

Printer used: Epson Stylus Photo 870 printer

Print quality: Photo 1440dpi

Paper: Premium Glossy Photo Paper

The data in Table 1 show that as the quantity of the more hydrophobic polymer (HPC) is increased, so the density of ink transferred during the drytime test increases, indicating a much slower rate of absorption. This data therefore shows the detrimental effect that adding a significant quantity of hydrophobic polymer to the formulation of the present invention would have on the rate of ink absorption off of the surface.

In the previous Declaration, she also stated that if fine inorganic or organic powder were included in the porous hydrophilic polymer layer, the overall porosity of the layer would be reduced as some of the particles would fill in the pores already created in the polymer and any spaces between the particles would be filled up with the swellable hydrophilic polymer. This overall loss of porosity would result in a much slower rate of absorption of the ink off of the surface, thus again materially affecting the characteristics of the invention medium. In order to create a system having sufficient porosity to cope with all the printed fluid in the presence of fine inorganic or organic powder, one could use a very low level of hydrophilic polymer in comparison to the particles. This would allow all of the fluid to move rapidly off the surface and into the pores, but in addition, the level of hydrophilic polymer would have to be so low that the dye would also be located within the pores between the particles. This would mean that the dyes would have no protection from the environmental conditions and the image stability would be significantly reduced, thus materially affecting the characteristics of the invention.

The data in Table 2 below for additional experiments conducted similarly as described in the Example of the above-captioned application show the effect on the density of ink transferred during the drytime test when inorganic particles (in this case silica) are combined with PVA (the hydrophilic polymer):

PVA (g/m^2)	Silica (g/m^2)	Silica : PVA	Density of Ink Transferred
4	32	8 : 1	0.58
7	28	4 : 1	1.22
9	18	2 : 1	2.85
20.4	0	0 : 100	0.55

Table 2: The effect of combining inorganic particles (silica) with hydrophilic polymer (PVA)

NB. For all samples, the level of blowing agent used with respect to the PVA laydown was 50%.

Printer used: Epson Stylus Photo 870 printer

Print quality: Photo 1440dpi

Paper: Premium Glossy Photo Paper

The data in Table 2 indicate that a very low level of polymer must be used with the inorganic particles to achieve a low density of ink to be transferred during the drytime test. When higher levels of polymer were used with silica present, much higher densities of ink were transferred showing a much lower rate of ink absorption off of the surface. For comparison, data is shown for a coating containing hydrophilic polymer (PVA) in the absence of any silica, where a low density of ink is transferred indicating a good rate of absorption.

The data in Table 3 show the effect of this low level of polymer in the formulation on image light stability of various printed colour patches, when tested similarly as described in the Example at page 6, lines 9-13 of the above-captioned application:

PVA (g/m^2)	Silica (g/m^2)	Silica : PVA	Cyan	Magenta	Black	Green	Blue
4	32	8 : 1	-13.0%	-67.4%	-26.1%	+8.3%	-23.1%
7	28	4 : 1	-6.1%	-56.2%	-2.3%	+5.1%	-14.8%

9	18	2 : 1	+1.6%	-41.5%	-2.0%	-1.8%	-11.9%
20.4	0	0 : 100	-2.8%	-20.8%	-1.5%	-0.5%	-4.3%

Table 3: The effect of combining inorganic particles (silica) with hydrophilic polymer (PVA) on light fade

NB. For all samples, the level of blowing agent used with respect to the PVA laydown was 50%.

Printer used: Epson Stylus Photo 870 printer
Print quality: Photo 1440dpi
Paper: Premium Glossy Photo Paper

The data in Table 3 show that when very low levels of polymer are used in conjunction with the higher inorganic particle level needed to achieve fast absorption of the ink from the surface, the image fade is very poor. As higher levels of polymer are combined with the silica, so the image fade improves, but the rate of ink absorption is significantly slowed down. For comparison, data is shown for a coating covered within the invention containing hydrophilic polymer (PVA) in the absence of any silica, where good image stability is seen.

The data in Tables 2 and 3 therefore show that if inorganic particles are combined with the hydrophilic polymer, it is necessary to use a very low level of hydrophilic polymer to achieve a good rate of absorption, but this has a significant effect on the resulting image stability of the final inkjet receiver. The comparative data shows that by using the hydrophilic polymer in the absence of particles, both a good rate of absorption and good image stability can be achieved.

The undersigned declares further that all statements made herein of the undersigned's own knowledge are true and that all statements made on information and belief are believed to be true. These statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful

false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 9TH APRIL 2009

JBaker

Julie Baker